RocketRAID 35xx
SATAII Host Adapter
User's Guide

HighPoint

Revision: 1.0

Date: March 2009

HighPoint Technologies, Inc.

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About This Guide

The RocketRAID 35xx SATAII Host Adapter's User's Guide provides information about the functions and capabilities of the host adapter, and instructions for installing, configuring and maintaining RAID arrays hosted by the adapter.

The RocketRAID 35xx Host Adapter

The RocketRAID 35xx series is based on HighPoint's TerabyteArchitecture and high-performing Intel® IOP341 I/O Processor delivers enterprise-class SATA RAID 5 and RAID 6 performance for storage applications that need high bandwidth and high capacity sequential performance. The Intel® IOP341(800MHz) I/O Processor is one of the industry's highest performing RAID I/O processor engines for multi-channel SATA hardware RAID 5/6 controllers. The RocketRAID 35xx series of PCI-Express hardware RAID controllers leverages HighPoint TerabyteArchitecture and a powerful Intel® IOP341 I/O Processor to deliver the industry's leading RAID 6 performance.

The RocketRAID 35xx series offer a comprehensive line of hardware RAID controllers via cutting edge multi-lane connectors from 4,8,12,16 and 24 ports. All RocketRAID 35xx series controllers support RAID level 0, 1, 3, 5, 6, 10, 50 and JBOD.

The RocketRAID 35xx series offers a robust hardware RAID 6 protection, an additional disk drive failure tolerance provided by a second independent distributed parity scheme. It provides protection for mission-critical data from two concurrent disk failures. For instance, eliminating the risk of data loss if a second drive fails while rebuilding is in process.

An optional Battery Back Up with integrated write journaling enhances data availability through rapid data recovery from power outage events.

Comprehensive OS Support

HighPoint offers the broadest range of support for all major operating systems to ensure OS and hardware server compatibility. Drivers are available for all major operating systems, including Windows , Linux, Mac OS X and FreeBSD. GPL Licensed Linux drivers into main Linux kernel help customers easily install and configure the RocketRAID 35xx.

1 - Specifications and Features

Host Adapter Architecture

- TerabyteStream™ for Blazing Performance
- Intel IOP 81341(800MHz)
- PCI -Express x8
- 256 MB of DDR II memory with ECC protection(RocketRAID3522/3530/3540), One DIMM Socket with default 1GB of DDR2-533 SDRAM with ECC protection, upgrade to 2GB(RocketRAID 3560)
- Support up to 8/12/16/24 SATAII drives(RocketRAID3522/3530/3540/3560)
- Support 8 External ports(RocketRAID 3522);
  Support 12/16 Internal ports(RocketRAID 3530/3540);
  Automatic detect 24 Internal ports or 20 Internal & 4 External ports (RocketRAID 3560)
- Multi adapter support up to 4 adapters
- Intel RAID 6 (P+Q) for large capacity RAID arrays
- NVRAM for write journaling
- Battery Backup Unit (BBU) Optional
- RoHS compliant

Advance RAID Features

- Support RAID 0, 1, 3, 5, 6,10, 50 and JBOD
- Multiple RAID support
- Multiple Logical Drive Support
- BIOS booting support
- BIOS PnP and BBS (BIOS boot specification)support
- Write through and write back cache
- Online array roaming
- Online capacity expansion (OCE) and Online RAID level migration (ORLM)
- Quick and Background initialization for instant RAID configuration
- Automatic drive insertion / removal detection and rebuild
- 64bit LBA support greater than 2TB per volume

- S.M.A.R.T monitoring hard drive status for reliability
- Staggered Spinup with user selection in BIOS
- (MAID) spin down drives when array is idle

Array Monitors, Alerts and Indicators

- SMTP for email notification
- Hardware Monitor function(RocketRAID 3560)
- Alarm / Buzzer alerts for drive failure
- SAF-TE (I2C) support
- SGPIO enclosure management (RocketRAID 3530/3540/3560)
- SNMP for remote management
- Ethernet port for OBM (Out of Band Managment)
- NTP (Network Time Protocol)
- Intelli-VRM. (Intelligent Virtual RAID Managment)
- SHI – Storage Health Inspector (S.M.A.R.T. and disk maintenance)

RAID Management

- TerabyteSaver™ and TerabyteGuard™ for Data Protection and Reliability
- Firmware update in the Operating System
- Hot key (ctrl-h) boot-up RAID manager via BIOS
- API library for customizing AP
- Command Line Interface (CLI)
- Web browser-base RAID management software
- Disk scrubbing to prevent degraded RAID arrays
- Bad sector repair and re-mapping to reduce dropped drives
- ATA pass-through mode support

Operating System Support

- Windows XP, 2003, Vista, 2008 (32 and 64-bit versions)
- Linux
- FreeBSD
- Mac OS X 10.4.x & 10.5.x
- GPL licensed driver into Linux Kernel 2.6.25

PHYSICAL SPECIFICATIONS

Size: (160.0mm x 66.0mm) 6.26"L x 2.59"W (RocketRAID 3522)
(202.0mm x 96.0mm) 7.95" L x 3.77" W (RocketRAID 3530/3540)
(242.0mm x 111.0mm) 9.54" L x 4.38" W (RocketRAID 3560)

WEMI : FCC Part 15 Class B and CE

Thermal and Atmospheric Characteristics:

Work Temperature Range : +5 C ~ + 55 C

Relative Humidity Range : 5% ~ 60% non condensing

Storage Temperature : -20 C~ +80 C

MTBF: 920,585 Hours

Electrical Characteristics:

	RocketRAID 3522		RocketRAID 3530/3540		RocketRAID 3560	
PCI-e	3.3V	12V	3.3V	12V	3.3V	12V
Power	1W Max	10W Max	2W Max	14W Max	6W Max	15W Max

Understanding RAID Concepts and Terminology

The following concepts and terminology is commonly used when describing the functions of the RocketRAID 35xx Host Adapter.

Disk initialization

Initializing a disk writes necessary RAID configuration information to that disk. Disks must be initialized before configuring them into RAID arrays. The initialization process will destroy all data on the disk.

Disk Status

New The disk contains no data and has not been initialized.

Initialized The disk has been initialized and can be used for array creation.

Configured The disk has been assigned to one or more arrays, or configured as a spare disk.

Legacy The disk was used on other controllers before use with the RocketRAID 35xx (see *legacy disk* below).

Array initialization

A redundant array (RAID1,RAID5, RAID6, RAID10) needs to be initialized to ensure full performance and reliability. Non-redundant arrays (RAID0, JBOD) do not need to be initialized.

When you create a redundant array using the RocketRAID35xx controller's BIOS Configuration Utility, it will automatically start the initialization process. When creating an array using the HighPoint RAID Management Console software, you can specify an initialization option (Skip initialization, foreground and background).

Online RAID Level Migration

This term describes the ability to change one type of array (RAID level), into a different type of array (changing a RAID 1 array into a RAID 10 array for example). Data is still accessible during the migration process, and a base level of security is still active.

OCE, ORLM and the RocketRAID 35xx

The RocketRAID 35xx supports both Online Capacity Expansion (OCE), and Online RAID Level Migration (ORLM). Both features are supported by a single function - an array can be transformed from one RAID level to another RAID level while simultaneously being resized, even under I/O load.

Spare disk

A spare disk is a single disk that can be used to automatically rebuild a redundant array in case of drive failure. Spare disks may also be members of a RAID array. Any available space on these disks may be used to rebuild other broken arrays.

Legacy disk

Disks attached to the RocketRAID 35xx that contain valid partition tables will be identified as legacy disks. A legacy disk attached to the RocketRAID 35xx can be accessed by the operating system, but cannot be used to create RAID arrays. A legacy disk must be initialized before assigning it to an array.

Network Features

The RocketRAID 35xx offers a selection of network-oriented RAID Management functions. These features are integrated into the card's firmware, and can be administrated using the BIOS and Web-based management utilities.

SNMP Manager - Simple Network Management Protocol. Allows the administrator to view the current state of the entire RAID system.

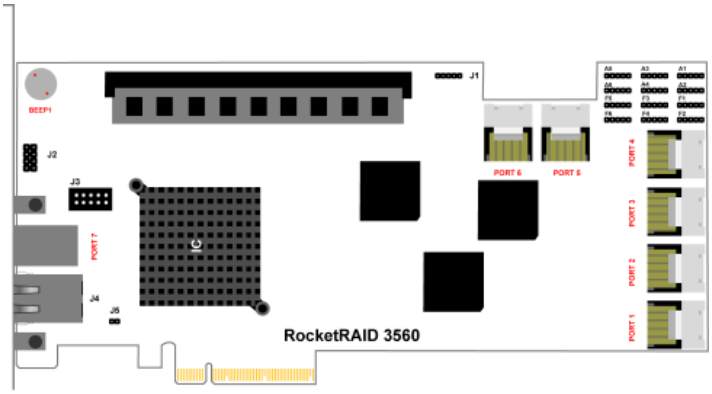
SNMP Trap - The RAID adapter can be configured to report events over the network. When an event is generated by the RAID Management utility, the SNMP Trap will send SNMP Trap messages to the Trap Receiver.

NTP - Network time protocol. The RocketRAID 35xx's firmware automatically synchronizes it's internal clock to match that of the selected server. If a NTP server is not specified, the adapter will synchronize itself with the host system's BIOS clock.

Hardware - Description and Installation

1-RocketRAID Adapter layout

1.1 – RocketRAID 3560 Adapter layout



Port1 to Port6

These represent RocketRAID 3560's 6 Internal Mini-SAS ports. Each port can direct connect up to 4 hard drives.

Port7

This represents RocketRAID 3560's additional External Mini-SAS port. With the automatic port selection funtion, Port7 can be used when Port1 has no disks attached during power up,this port can direct connect up to 4 hard drives.

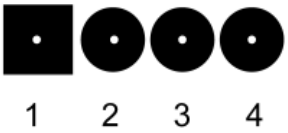
DIMM1

The connector represents one DDR2-533 DIMM socket that allows for upgrading up to 2GB of memory. By default,it supports 1GB of ECC DDR533 SDRAM memory.

A1-A6, F1-F6

A1-A6 are Disk Activity LED's; F1-F6 are Disk Faliture LED's.

A1/A2/A3/A4/A5/A6
F1/F2/F3/F4/F5/F6



Pin Number / Connection	Pin1	Pin2	Pin3	Pin4
A1/F1	Driver1	Driver2	Driver3	Driver4
A2/F2	Driver5	Driver6	Driver7	Driver8
A3/F3	Driver9	Driver10	Driver11	Driver12
A4/F4	Driver13	Driver14	Driver15	Driver16
A5/F5	Driver17	Driver18	Driver19	Driver20
A6/F6	Driver21	Driver22	Driver23	Driver24

J1

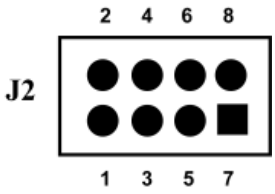
This jumper supports SAF-TE interface(I2C).

Pin Number	Pin Description
Pin1	SCL
Pin2	GND
Pin3	SDA

J2

LCD connector for LCD Panel and Push Button

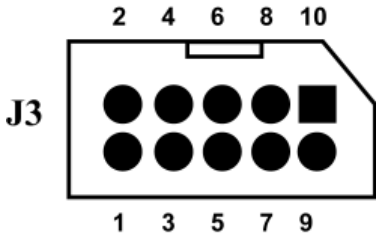
Pins defined as follow:



Pin Number	Description
1	+5V
2	GND
3	LCD_INT
4	NC
5	SDA2
6	SCL1
7	SDA1
8	SCL2

J3 (BBU connector)

Connector for battery backup unit (optional part).



BEEP1 – Speaker

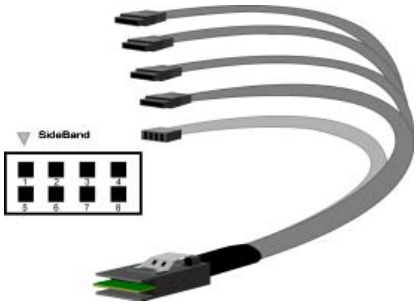
Alarm (speaker): the speaker emits and audible alarm in the case of disk/array failure.

Ethernet Port

Ethernet port(J4) for Out of Bound Manegement, support Net Time Protocol.

Cable – Internal Mini-SAS to SATA

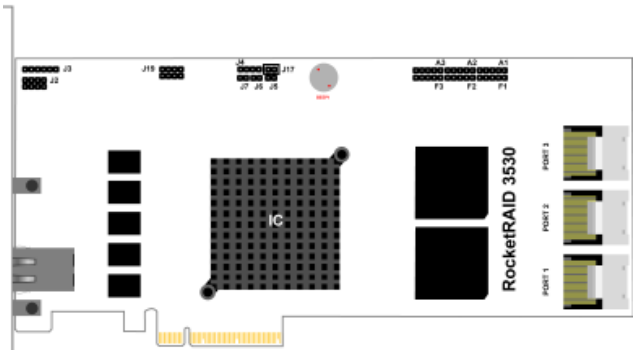
The integrated RocketRAID 3560 includes 6 Internal Mini-SAS to SATA cables, each of the RocketRAID 3560's cables can support SGPIO SideBand Connector. Pins defined as follows:
As follows:



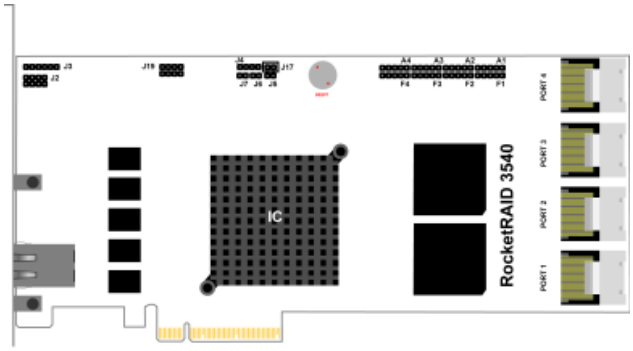
Pin Number	Pin description
Pin1	NC
Pin2	SDATAIN
Pin3	GND
Pin4	SDATAOUT
Pin5	SLOAD
Pin6	GND
Pin7	SCLOCK
Pin8	NC

1.2 – RocketRAID 3530/3540 Adapter layout

RocketRAID 3530



RocketRAID 3540



Port1-4

These represent the RocketRAID 3530/3540's Internal Mini-SAS ports. Each port can support up to 4 SATA hard disks. The RR3530 is 3 Mini-SAS ports, and can support up to 12 disks. The RR3540 is 4 Mini-SAS ports, and can support up to 16 hard disks.

A1-A4/F1-F4

LED connections. "A" refers to the disk activity connectors, and those marked "F" function as disk failure connectors

Note: *The RocketRAID 3530 supports 12 disks, and only provides 3 LED connectors for each function (A1-A3 ,F1-F3).*

Connectors A1-A4 provides LED support for Drive Activity, while connectors F1-F4 indicates Drive Failure.
ACT LED and Fail LED have 5 pins while we just explain 4 pin's function.

Pin Number / Connection	Pin1	Pin2	Pin3	Pin4	Pin5
A1/F1	Driver1	Driver2	Driver3	Driver4	NC
A2/F2	Driver5	Driver6	Driver7	Driver8	NC
A3/F3	Driver9	Driver10	Driver11	Driver12	NC
A4/F4	Driver13	Driver14	Driver15	Driver16	NC
A5/F5	Driver17	Driver18	Driver19	Driver20	NC
A6/F6	Driver21	Driver22	Driver23	Driver24	NC

J4

This jumper is the SAF-TE interface port (for disk enclosures/chassis)
SAF-TE jumper has 4 pins while we just explain 3 pin's function.

Pin Number	Pin Description
Pin1	SCL
Pin2	GND
Pin3	SDA
Pin4	NC

BEEP1 -(alarm/speaker)

the speaker emits and audible alarm in the case of disk/array failure.

J17

This jumper can be used to enable or disable the card's alarm (BEEP1). The alarm is enabled by default (the jumper is attached). To disable the alarm, remove the jumper

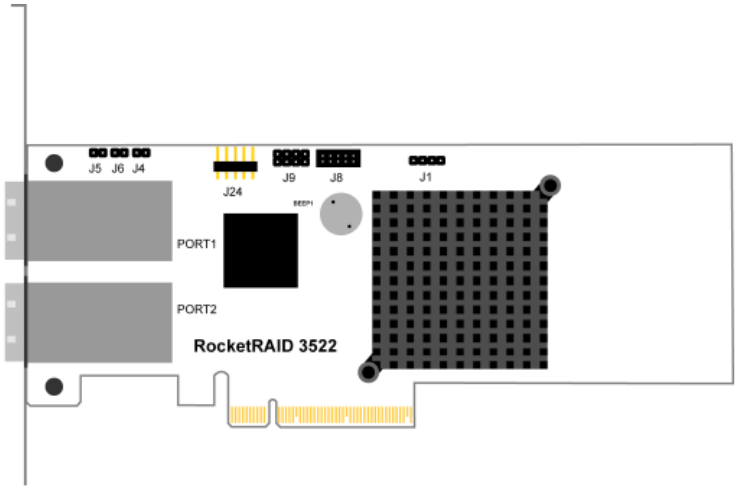
J18 (BBU connector)

Connector for battery backup unit (optional part).

Ethernet Port

Ethernet port (U32) for Out of Band Management, support Net Time Protocol.

1.3 – RocketRAID 3522 Adapter layout



Port1, Port2

These represent the RocketRAID 3522's two External Mini-SAS ports. Each port can support up to 4 hard disks.

J1 - SAF-TE connector

BEEP1 – Speaker

Alarm (speaker): the speaker emits and audible alarm in the case of disk/array failure.

J8 (BBU connector)

Connector for battery backup unit (optional part).

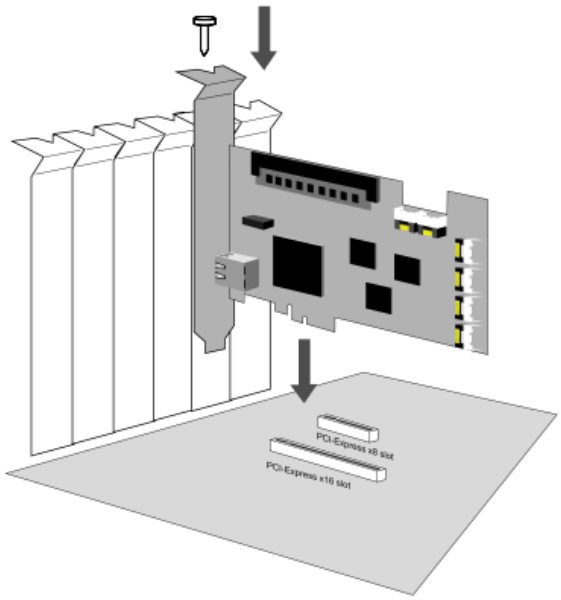
2 – Installing the RocketRAID Host Adapter

2.1 – Installing the RocketRAID 35xx Host Adapter

Note: Make sure the system is powered-off before installing the RocketRAID 35xx host adapter.

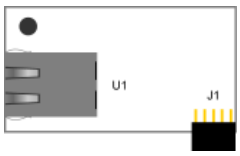
1. Open the system chassis and locate an unused PCI-E x8.
2. Remove the PCI slot cover.
3. Gently insert the RocketRAID 35xx into the PCI-E slot, and secure the bracket to the system chassis.
4. After installing the adapter, attach the Mini-SAS connectors to the RocketRAID 35xx's Mini-SAS port,and to chassis backplane. Each Mini-SAS cable supports up to 4 hard disk drives. Consult the chassis's manual for proper installation procedures.
5. Close and secure the system chassis.

(*illustration shows* RocketRAID *3560)*



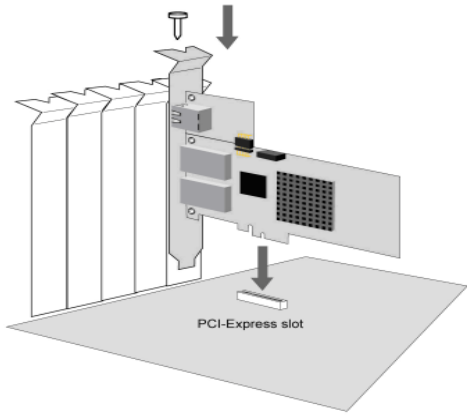
2.2.– Installing the HighPoint Ethernet Board for RocketRAID 3522 Host Adapter

1. Installing the HighPoint Ethernet Board – the following illustration shows the HighPoint Ethernet Board



U1 is the RJ45 connector. J1 is connector for connecting the HighPoint Ethernet Board to the RocketRAID Host Adapter. If you want to use the Ethernet functions, connect the HighPoint Ethernet Board to the RocketRAID Host Adapter via connectors J24 through J1, and secure the two boards to the bracket. If you do not want to use the Ethernet function, secure the RocketRAID Host Adapter to the bracket.

2. Illustration shows RocketRAID 3522 host adapter with Ethernet Board installing .



3 - Verifying Installation

Once the RocketRAID host adapter and hard drives have been installed into the chassis, boot-up the system to verify that the hardware is properly recognized.

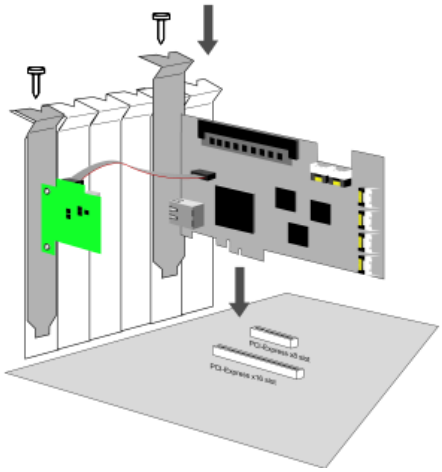
1. Power on the system. If the system detects the presence of the adapter, the RocketRAID BIOS Utility will be displayed during bootup.
2. Press **Ctrl+H** to access the RocketRAID adapter's BIOS Utility.

The BIOS Utility will display information about hard disks attached to the adapter. Make sure all attached disks are detected by this utility. If any of the hard disks are not detected, power down the system and check the power and cable connections

4 - Battery Backup

A battery backup option is available as an optional add-on component. The battery provides additional data security in case of a critical system failure. Data normally lost during a major system fault, such as a power outage or CPU failure, which was in transit at the time of the failure (stored in the card's onboard cache), will remain viable for up to 72 hours. The battery unit can be attached to the card using the BBU CONN. Attach the BBU to the RocketRAID 35xx, using the cable included with the BBU unit:

(illustration shows the RocketRAID 3560)

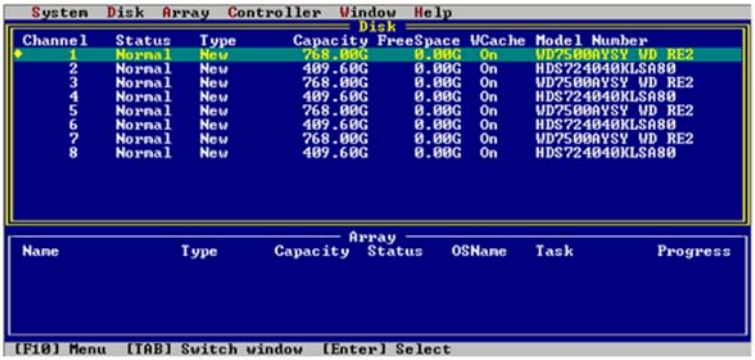


RocketRAID BIOS Utility

The RocketRAID 35xx card will display it's BIOS screen during the system's boot process.
Press Control + H when prompted, to access the BIOS settings Menu.

1 - BIOS Settings Overview

The RocketRAID 35xx BIOS utility is an interface that provides management commands and controller related settings.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
1 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
2 Normal New 409.60G 0.00G On HDS724040KLSA80
3 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
4 Normal New 409.60G 0.00G On HDS724040KLSA80
5 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
6 Normal New 409.60G 0.00G On HDS724040KLSA80
7 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
8 Normal New 409.60G 0.00G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress
[F10] Menu [TAB] Switch window [Enter] Select

Using the BIOS Utility

The following keys utilized by the RocketRAID 35xx BIOS utility:

F10 – press F10 to highlight the tool bar Menu.
Arrow keys – use these to move between different menu items
Enter – Open the selected toolbar command/execute the selected command.
Esc – move back to the previous menu, cancel the selected operation.
Tab – Switch between Disk and Array menus, move to next Menu item.
Space Bar – select an item (when selecting Block Size for a RAID configuration, for example).

BIOS Menu Shortcuts

The BIOS interface can also be navigated using key stroke combinations (Alt +" X"). When viewing the interface, letters highlighted in "red" represent the "X" values:

"S" – System

"D" – Disk

"A" – Array

"C" – Controller

"W" – Window

"H" – Help

"X" - Exit

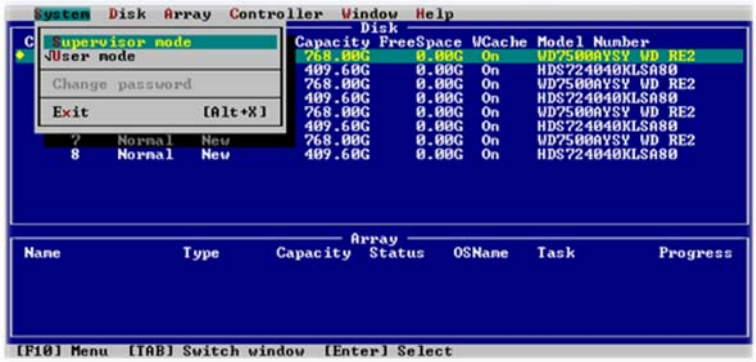
Logging In

The BIOS Utility has two interface modes: **User** and **Supervisor**

The User mode can only view information about the RocketRAID card, disks and arrays.

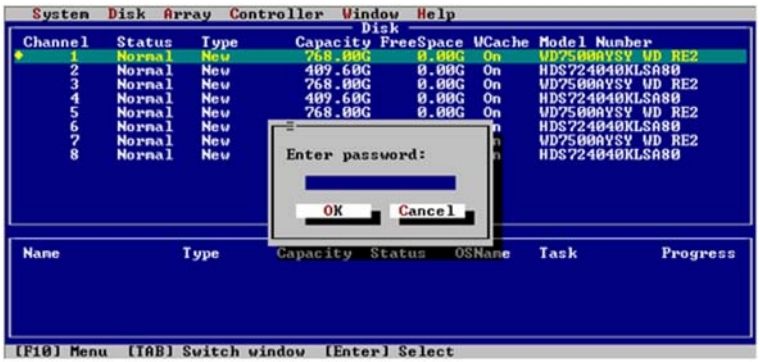
The Supervisor mode is used to create/delete arrays, and configure RocketRAID related settings. Supervisor mode requires a password – this is the same password that you will need in order to use the Web Management interface.

Press **F10** – this should bring you to the "**System**" toolbar command. Press Enter.


System Disk Array Controller Window Help
Supervisor mode
√User mode
Change password
Exit [Alt+X]
Disk
Capacity FreeSpace WCache Model Number
768.00G 0.00G On WD7500AYSY WD RE2
409.60G 0.00G On HDS724040KLSA80
768.00G 0.00G On WD7500AYSY WD RE2
409.60G 0.00G On HDS724040KLSA80
768.00G 0.00G On WD7500AYSY WD RE2
409.60G 0.00G On HDS724040KLSA80
768.00G 0.00G On WD7500AYSY WD RE2
409.60G 0.00G On HDS724040KLSA80
7 Normal New
8 Normal New
Array
Name Type Capacity Status OSName Task Progress
[F10] Menu [TAB] Switch window [Enter] Select

To log on as a User, use the arrow keys to highlight "**User mode**", and press Enter.

To log on as Supervisor, select "**Supervisor Mode"**:, and press Enter.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
1 Normal New 768.00G 0.00G On VD7500AYSY VD RE2
2 Normal New 409.60G 0.00G On HDS724040KLSA80
3 Normal New 768.00G 0.00G On VD7500AYSY VD RE2
4 Normal New 409.60G 0.00G On HDS724040KLSA80
5 Normal New 768.00G 0.00G On VD7500AYSY VD RE2
6 Normal New HDS724040KLSA80
7 Normal New VD7500AYSY VD RE2
8 Normal New HDS724040KLSA80
Enter password:
OK
Cancel
Name Type Capacity Status OSName Task Progress
[F10] Menu [TAB] Switch window [Enter] Select

You will be asked to enter the Supervisor password.
The default password is "**hpt**".

BIOS Commands

System

User/Supervisor modes – interface modes
Change password - for Supervisor mode
Exit the utility – quit and exit the RocketRAID BIOS utility

Disk

Information – displays information about the select hard disks
Initialize – initialize the selected disks (required in order to use new hard disks for creating RAID arrays, disk replacement, or configuring spare disks.
Toggle Spare – configure spare disks.
Unplug – remove the selected disks (hot-swap)
Turn on write cache – enable write cache for the selected disks
Turn off write cache – disable write cache for the selected disks
Rescan – prompts the RocketRAID card to scan for new hard disks.

Array

Information – displays information about the selected RAID array
Create – Create a RAID array using the selected disks
Delete – Delete the selected RAID array
Unplug – Remove the selected RAID array (safe removal of disk members of the target array - hot-swap)
Verify – Verify the selected array (checks for parity errors)
Start Task – **End Task** – Stop/Pause current task

Controller

Information – View information about the RocketRAID host adapter
Eventlog – View event log entries
Setting – View and configure host adapter settings
Network – View and configure host adapter network configuration

Window

Maximize – enlarge the selected Window
Restore – restore Windows sizes to default setting
1.Disk – toggle/select the Disk Window
2.Array – toggle/select the Array Window
Refresh – updates on screen information

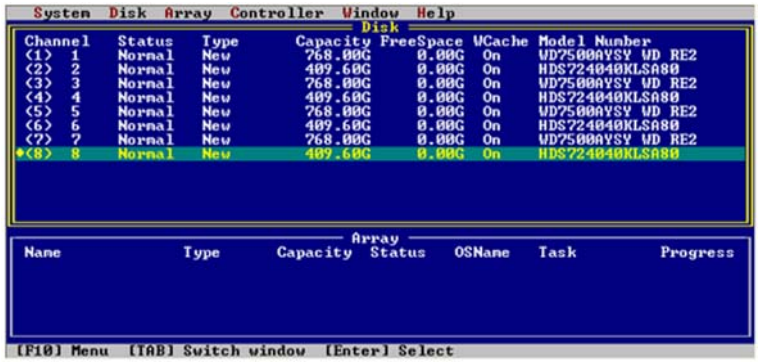
Help

About – BIOS utility/Company information

2 - Creating RAID Arrays

Initializing Disks:

Before creating a RAID array, the disks must be initialized. Disk initialization writes necessary RAID configuration information to the hard disks.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
(1) 1 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
(2) 2 Normal New 409.60G 0.00G On HDS724040KLSA80
(3) 3 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
(4) 4 Normal New 409.60G 0.00G On HDS724040KLSA80
(5) 5 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
(6) 6 Normal New 409.60G 0.00G On HDS724040KLSA80
(7) 7 Normal New 768.00G 0.00G On WD7500AYSY WD RE2
(8) 8 Normal New 409.60G 0.00G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress
[F10] Menu [TAB] Switch window [Enter] Select

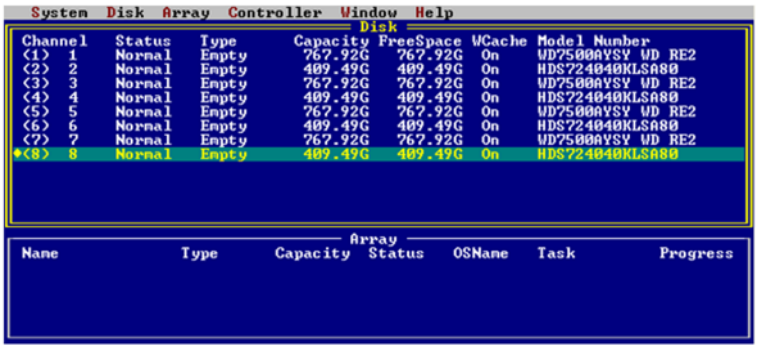
1. From the Disk window, highlight the target disks using the arrow keys, then select using Enter. A numeral will be displayed before each selected disk.
2. Once all target disks have been selected, select **Disk** from the tool bar, then highlight Initialize and press Enter.
3. The utility will display a warning, and ask you to press Y (yes) to initialize, or N (no) to cancel. Once initialized, these disks can be used to create RAID arrays. ***Warning:*** *Initialization will destroy all pre- existing data on the selected hard disks. Only initialize disks that do not contain critical data. Disks only need to be initialized once.*

Warning: *Initialization will destroy all pre- existing data on the selected hard disks. Only initialize disks that do not contain critical data. Disks only need to be initialized once.*

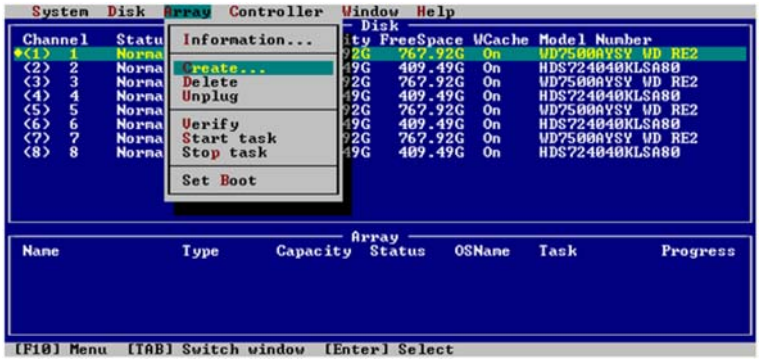
Disks do not have to be re-initialized after an array is deleted, or before creating a new array.

Creating Arrays:

From the Disk window, highlight the target disks using the arrow keys, then select using Enter. A numeral will be displayed before each selected disk. To de-select a disk, highlight the target disk, and press Enter once more.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
(1) 1 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
(2) 2 Normal Empty 409.49G 409.49G On HDS724040KLSA80
(3) 3 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
(4) 4 Normal Empty 409.49G 409.49G On HDS724040KLSA80
(5) 5 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
(6) 6 Normal Empty 409.49G 409.49G On HDS724040KLSA80
(7) 7 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
*(8) 8 Normal Empty 409.49G 409.49G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress

Once all target disks have been selected, select **Array** from the tool bar, then highlight **Create** and press Enter.



This will open the RAID creation Menu.

1. **Array Type:** First, use the Tab or arrow keys to highlight the desired RAID level, and press the Spacebar to select the Array Type. The RocketRAID 35xx host adapters support RAID 0, 1, 3, 5, 6, 10, 50 and JBOD.

2. **Cache Policy:** Specify the Cache Policy of the array.

    a. **None:** No cache policy set

    b. **Write**-back – utilizes disk cache. Default setting, optimal for performance.

    c. **Write**-through – data is written directly to disk. More secure than Write-back, but will perform slower.

3. **Init Method –** For redundant arrays (RAID 0,1, 3, 5, 6, 10 and 50) specify the RAID Initialization method.

    a. **Quick init –** use this option if you want to quickly create an array for testing purposes. This will clear all previous data, and will not build parity. Do not use this method if data integrity is priority.

    b. **Foreground –** this will instruct the host adapter BIOS utility to start the initialization process immediately after creating the array. This option is recommended for data security.

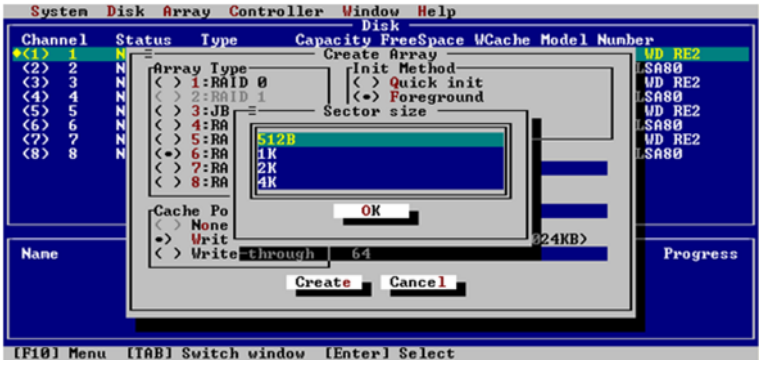
    c. **Background –** this will instruct the host adapter to initialize the array in the background, after the operating system has booted. Consider this option if you need to install an operating system to the array – this allows the array to be used immediately.

4. **Name:** Use the Tab or arrow keys and highlight **Name**. This feature allows you to name an array for reference. This is an optional setting. Press **Enter** to use the default name, or type in the desired name, and press **Enter**.

5. **Capacity (GB):** The adapter will display the full available capacity by default. If you want to specify the size of the array, type in the desired capacity (in Gigabytes), and press **Enter**. Specifying the capacity allows you to create multiple arrays using the same set of disks. Any free disk space can be used to create additional arrays, or used as a **Spare** disk (if the available capacity meets the requirement – see **5 - Maintaining Arrays – Spare Disks**, for more information).

6. **Block Size –** This option allows you to specify the block size (also known as "stripe size") for specific array types (RAID 0, 1,3, 5, 6, 10 and 50). You can specify block sizes ranging from 16(KB) to 1024(KB). This allows you to tailor the array for specific applications. A balanced block size of 64 (in KB) is recommended for most applications.

7. **Create / Cancel –** Use Tab or arrow keys to highlight the **Create** or **Cancel** options, and press **Enter**. Selecting **Cancel** will stop the creation process. Selecting **Create** will create an array based on your selections, and open the **Sector Size** window.



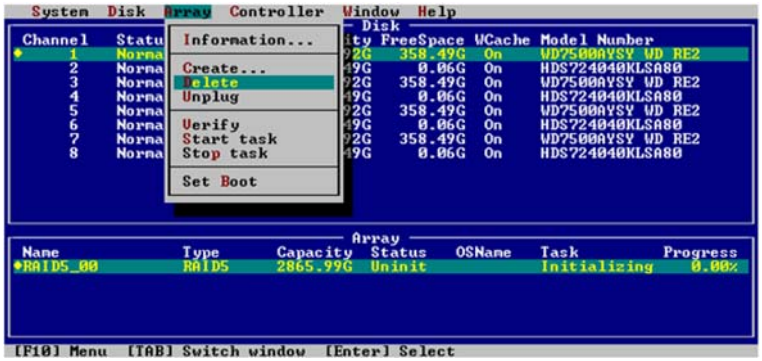
8. **Sector Size –** Also known as VSS (Variable Sector Size), this option allows you to specify the sector size of the array, for use With Windows operating systems. Older, 32-bit versions of Windows do not support volumes over 2TB in size, unless the sector size is altered. This option is not needed for Windows XP 64, Win2003 (SP1), Windows 2008, or Windows Vista. These operating systems support larger volumes, and introduce a partitioning method known as GPT (GUID Partition table). Use GPT when creating arrays over 2TB in size. For Windows 2000, or 32-bit versions of XP, refer to the following chart:

512B – Default sector size (supports up to **2TB**). Use this setting for Windows OS that support GPT.
1K – Supports arrays up to **4TB**
2K – Supports arrays up to **8TB**
4K – Supports arrays up to **16TB**

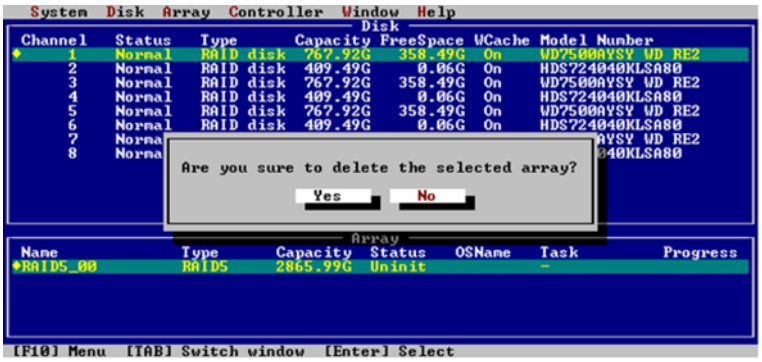
Highlight the appropriate Sector Size, and press Enter to create the array.

3 – Deleting Arrays

From the Array window, highlight the target array and press **Enter**. Highlight **Array** from the toolbar.


System Disk Array Controller Window Help
Information...
Create...
Delete
Unplug
Verify
Start task
Stop task
Set Boot
Disk
Channel Statu ity FreeSpace WCache Model Number
1 Norma 2G 358.49G On WD7500AYSY WD RE2
2 Norma 49G 0.06G On HDS724040KLSA80
3 Norma 2G 358.49G On WD7500AYSY WD RE2
4 Norma 49G 0.06G On HDS724040KLSA80
5 Norma 2G 358.49G On WD7500AYSY WD RE2
6 Norma 49G 0.06G On HDS724040KLSA80
7 Norma 2G 358.49G On WD7500AYSY WD RE2
8 Norma 49G 0.06G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress
RAID5_00 RAID5 2865.99G Uninit Initializing 0.00%
[F10] Menu [TAB] Switch window [Enter] Select

Select Delete and press **Enter**. The utility will display a warning message. Press **Y** (yes) to delete the array, or select **N** (no) to cancel.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
1 Normal RAID disk 767.92G 358.49G On WD7500AYSY WD RE2
2 Normal RAID disk 409.49G 0.06G On HDS724040KLSA80
3 Normal RAID disk 767.92G 358.49G On WD7500AYSY WD RE2
4 Normal RAID disk 409.49G 0.06G On HDS724040KLSA80
5 Normal RAID disk 767.92G 358.49G On WD7500AYSY WD RE2
6 Normal RAID disk 409.49G 0.06G On HDS724040KLSA80
Are you sure to delete the selected array?
Yes
No
Array
Name Type Capacity Status OSName Task Progress
RAID5_00 RAID5 2865.99G Uninit -
[F10] Menu [TAB] Switch window [Enter] Select

Warning: all data stored on the array will be lost – do not delete if the array contains critical data.

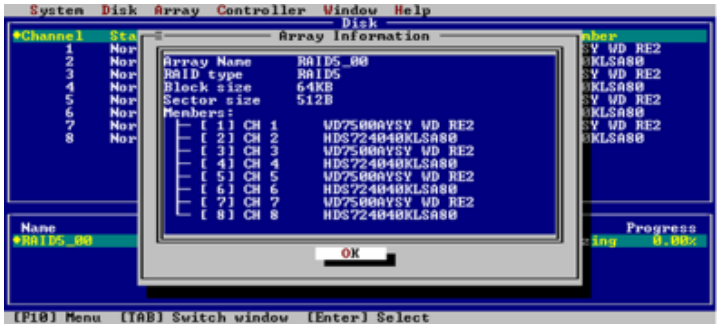
4 – Monitoring the Host Adapter, Arrays and Devices

The BIOS Settings Utility allows the Administrator to check the status of the RocketRAID host adapter, and any devices (hard disks), and arrays hosted by the adapter.

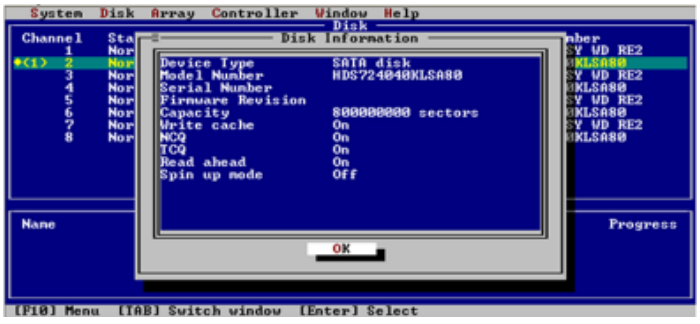
Disk/Array Status

To check the status of any disk or array, use Tab to select the Disk or Array Windows, highlight the target disk/array and press enter.

Array Information – this will display the array's Name, RAID type, Block size, Sector size, member hard disks, and status.


System Disk Array Controller Window Help
Disk
Array Information
Array Name RAID5_00
RAID type RAID5
Block size 64KB
Sector size 512B
Members:
[1] CH 1 WD7500AYSY WD RE2
[2] CH 2 HDS724040KLSA80
[3] CH 3 WD7500AYSY WD RE2
[4] CH 4 HDS724040KLSA80
[5] CH 5 WD7500AYSY WD RE2
[6] CH 6 HDS724040KLSA80
[7] CH 7 WD7500AYSY WD RE2
[8] CH 8 HDS724040KLSA80
OK
Name
Progress
[F10] Menu [TAB] Switch window [Enter] Select

Disk Information – this will display the disk Model Number, serial number, firmware revision, capacity, and various disk related settings (NCQ, TCQ, Read Ahead, Write Cache, and Staggered Drive spinup mode).



Alternately, highlight the target disk/array, then highlight either Disk or Array from the tool bar, select Information, and press Enter.

Controller Information

Highlight **Controller** from the toolbar, select **Information**, and press **Enter**.

Array Information – this will display the array's Name, RAID type, Block size, Sector size, member hard disks, and status.

This option will display information about the host adapter's model (Product ID), PCI-E bus location, IO Processor model, memory, firmware revision, serial number, and the status of the BBU (battery backup unit).

Event Log

The RocketRAID host adapter automatically generates Event Log entries during the case of routine administration (creating arrays), or in the case of a critical error (disk or array failure).

Highlight **Controller** from the toolbar, select **Event Log**, and press **Enter**.

System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
Eventlog
Filter: [X] Information [X] Warning [X] Error
Time Type Description
2007-09-27 11:00:45 Info Test eventlog 1.
2007-09-27 11:01:45 Warning Test eventlog 2.
2007-09-27 11:02:45 Error Test eventlog 3.
2007-09-27 11:03:45 Info Test eventlog 4.
2007-09-27 11:04:45 Warning Test eventlog 5.
2007-09-27 11:05:45 Error Test eventlog 6.
2007-09-27 11:06:45 Info Test eventlog 7.
2007-09-27 11:07:45 Warning Test eventlog 8.
2007-09-27 11:08:45 Error Test eventlog 9.
2007-09-27 11:09:45 Info Test eventlog 10.
Clear Prev Next Cancel
[F10] Menu [TAB] Switch window [Enter] Select

Use this option to view Event Log information, including **Errors** (disk or array failure), **Warnings** (problems such as disk sector or Smart issues) and **Information** (such as the creation or deletion of arrays).

You can filter displayed events by using Tab to highlight the **Information**, **Warning**, and **Error** options towards the top of the window. Enable or disable these filter options using the **Spacebar**.

Use the Clear option to delete all Event Log entries. Use the **Prev** and **Next** option to scroll through log entries. Select **Cancel** (or press Esc) to exit the window.

5 – Maintaining Arrays

The BIOS Settings Utility provides several RAID and device related maintenance functions, including device and controller settings, Network Configuration settings (for managing the host adapter, remotely), and rebuilding broken/degraded RAID arrays.

Network Settings

This option allows the Administrator to configure Network Settings for use with the RocketRAID host adapter's Out-of-Band (OOB), and In-Band (IB) Management functions.

Highlight Controller from the toolbar, select **Network**, and press **Enter**.

This option will display information about the host adapter's network settings. By default, these settings are configured automatically, based on information provided by the local network. To manually configure these settings, use the Tab or arrow keys and highlight **Use automatic config**, and press the **Spacebar**. Type in the appropriate network settings, highlight **OK**, and press **Enter**.

Controller Settings

Highlight Controller from the toolbar, select Settings and press Enter.

System Disk Array Controller Window Help
Controller Setting
[X] Enable audible alarm
[ ] Enable staggered spin up
Number of drives per spin up
Delay between spin up (seconds)
[ ] Spin down idle disk (minutes)
[ ] Enable automatic rebuild
Rebuild priority
( ) lowest
( ) low
( ) medium
( ) high
( ) highest
[X] Provide INT13 support
[X] Use single BCU entry
[X] Stop on error
[X] NCQ
[ ] SGPIO for LED control
OK
Cancel
[F10] Menu [TAB] Switch window [Enter] Select

Use the tab and arrow keys to select each item, and the Spacebar to enable/disable the target option.

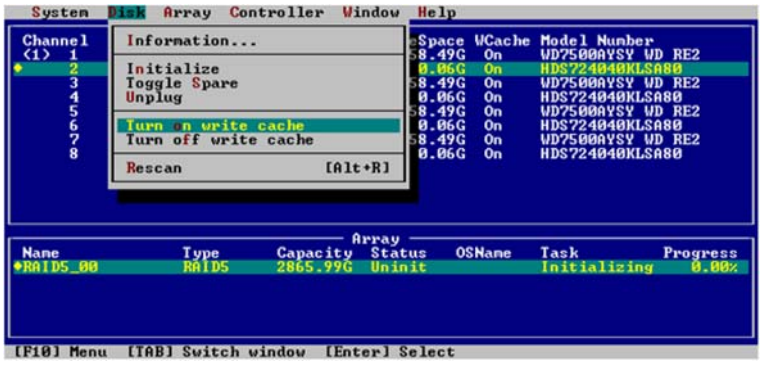
- **Enable Audible Alarm** – enables/disables card's alarm (beeper)
- **Enable Staggered drive spinup** – enable/disable staggered drive spin-up. Disabled by default. If enabled, the host adapter will spin disks in sequence (one disk, every "x#" of seconds – enter the desired value). Some hard disks do not support this setting – consult the hard disk's documentation for more information.
- **Spin down idle disk** – If enabled, the host adapter will power down idle (inactive) disks/arrays based on the allotted time. Specify the value (in minutes)
- **Rebuild Priority** – This option is provided for redundant arrays. This setting determines the priority of rebuilding arrays in regards to other system tasks.
- **Provide INT13 support** – enable or disable INT13 (the host adapter's boot function). Disabling this setting may resolve motherboard BIOS related issues in cases where the card cannot be loaded into memory properly (option ROM/out of memory errors).

- **Use Single BCV Entry** – also related to motherboard BIOS settings (troubleshooting)
- **Stop on Error** – Enabled by default. If disabled, the host adapter BIOS menu will bypass array or device errors when booting the system.
- **NCQ** – enable/disable NCQ (native command queuing)

Device Settings

These options allow the administrator to enable or disable hard disk cache related settings.

From the Disk Window, highlight the target disk and press Enter. Highlight Disk from the toolbar:



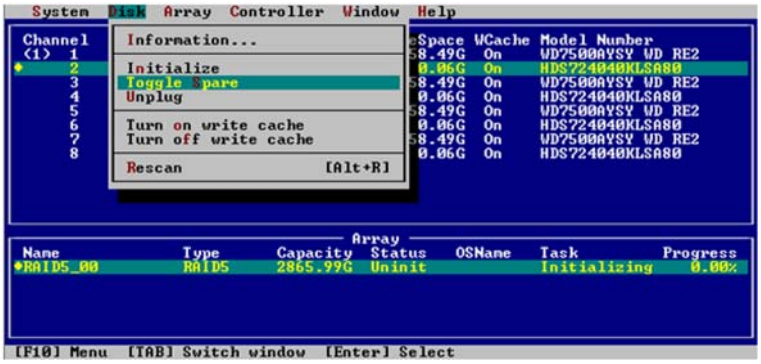
Turn on Write cache – enables the use of the hard disk cache. This is the recommended setting

Turn off write cache – disable the use of the hard disk cache. Use this setting for troubleshooting hard disks, or for testing purposes. Disabling disk cache will lower performance

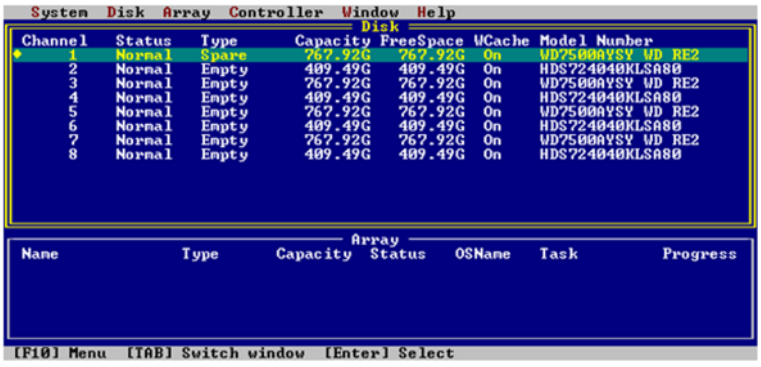
Spare Disks

Spare Disks are used to automatically rebuild Redundant RAID arrays in the case of disk failure. As with creating RAID arrays, disks must be initialized before they can be used as spares. To set a hard disk to act as a Spare Disk, switch to the Disk window, use the arrow keys to select the target disk from the list of initialized disks, and press **Enter**.

Highlight **Disk** from the toolbar, then select **Toggle Spare**, and press **Enter**.



To remove a spare, follow the same procedure. From the Disk window, select the target Spare disk and press Enter. Highlight **Disk** from the toolbar, select **Toggle Spare** and press **Enter**.


System Disk Array Controller Window Help
Disk
Channel Status Type Capacity FreeSpace WCache Model Number
1 Normal Spare 767.92G 767.92G On WD7500AYSY WD RE2
2 Normal Empty 409.49G 409.49G On HDS724040KLSA80
3 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
4 Normal Empty 409.49G 409.49G On HDS724040KLSA80
5 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
6 Normal Empty 409.49G 409.49G On HDS724040KLSA80
7 Normal Empty 767.92G 767.92G On WD7500AYSY WD RE2
8 Normal Empty 409.49G 409.49G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress
[F10] Menu [TAB] Switch window [Enter] Select

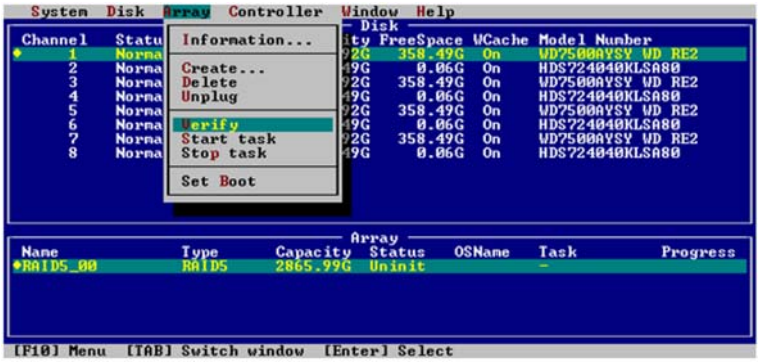
Generally, single disks are designated to act as spares (disks that are not configured into RAID arrays).

However, in some instances, disks that are members of RAID arrays may also be assigned to act as a spare disk. If the disks in question are part of a RAID array that did not utilize the full available capacity at the time of creation, these disks may be used as spares. For example: a RAID 0 array was created between two 200GB hard disks, but only 200GB of space (out of a grand total of 400GB), was assigned to that array. In this example, 200GB of disk space remains unallocated. This unallocated space allows these disks to be set as spares for a separate redundant array that meets the capacity requirement (200GB or less).

Verifying Arrays

Routine RAID verification is essential for maintaining the integrity of data stored on redundant RAID arrays. The RocketRAID BIOS utility allows you to manually verify RAID arrays.

From the Array window, highlight the target array and press **Enter**. Highlight **Array** from the toolbar, select **Verify**, and press **Enter**.


System Disk Array Controller Window Help
Information...
Create...
Delete
Unplug
Verify
Start task
Stop task
Set Boot
Disk
Channel Statu ity FreeSpace WCache Model Number
1 Norma 2G 358.49G On WD7500AYSY WD RE2
2 Norma 49G 0.06G On HDS724040KLSA80
3 Norma 2G 358.49G On WD7500AYSY WD RE2
4 Norma 49G 0.06G On HDS724040KLSA80
5 Norma 2G 358.49G On WD7500AYSY WD RE2
6 Norma 49G 0.06G On HDS724040KLSA80
7 Norma 2G 358.49G On WD7500AYSY WD RE2
8 Norma 49G 0.06G On HDS724040KLSA80
Array
Name Type Capacity Status OSName Task Progress
RAID5_00 RAID5 2865.99G Uninit -
[F10] Menu [TAB] Switch window [Enter] Select

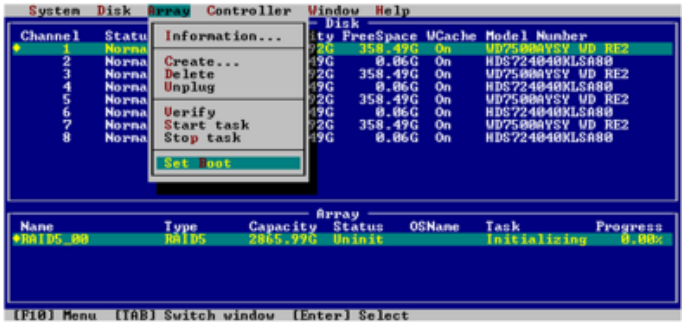
Progress will be displayed towards the lower right-hand corner of the screen (percent complete).

To stop or pause the verification process, select **Stop Task** from the same menu. To continue the verification process, select **Start Task**.

6 – Additional Functions and Settings

Set Boot

Highlight the target array from the Array window and press Enter. Highlight Array from the toolbar:



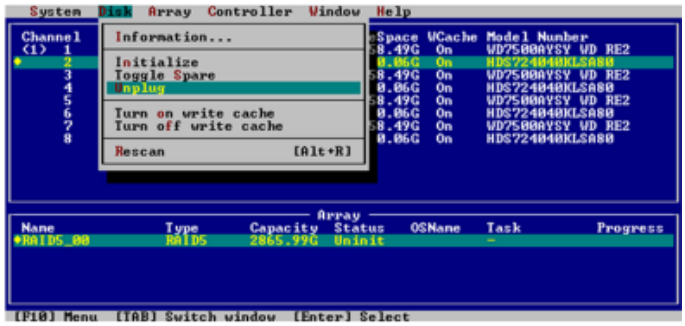
Note: Use this option to set an array to act as the boot device. The selected array will act as the boot "disk", if the motherboard's BIOS instructs the card to act as the system's boot device.

Hot-Swap

The BIOS utility provides several options that allow the administrator to add or remove disks and arrays, without powering down the system.

Adding/removing Disks

To prepare a disk for removal, first highlight the target disk using the Disk window and press **Enter**. Highlight Disk from the toolbar, select **Unplug,** and press **Enter**.

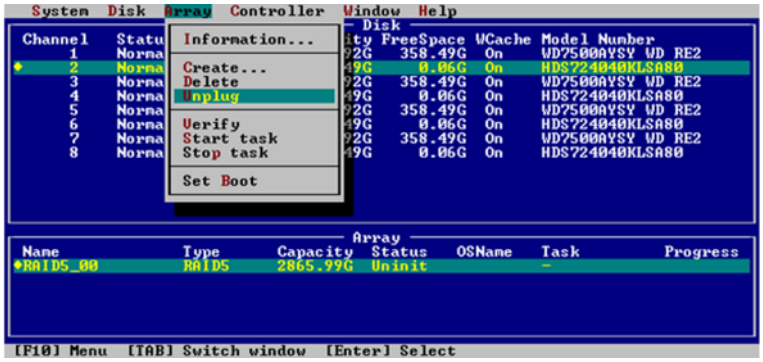


To add a disk, install the hard disk, then highlight **Disk** from the toolbar, select **Rescan**, and press **Enter**.

Note: After installing the disk into the hot-swap capable drive bay, wait several seconds to allow the disk to fully power on, before using the Rescan command.

Adding/removing Arrays

To prepare a RAID array for removal, highlight the target array using the Array window and press **Enter**. Highlight **Array** from the toolbar, select **Unplug**, and press **Enter**.



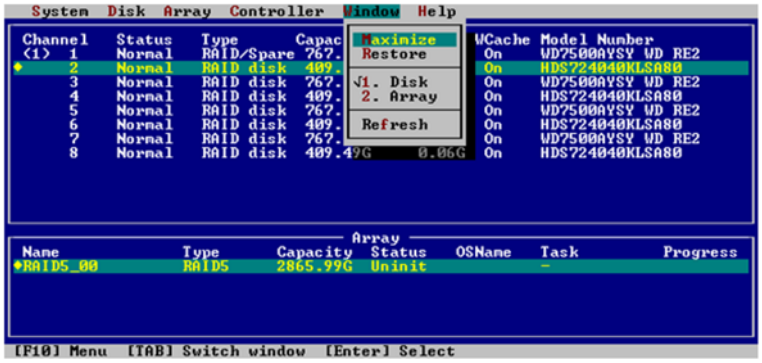
The interface will notify you when the disk can be removed.

To add an array, install all of the RAID hard disks, then highlight **Window** from the toolbar. Select **Refresh**, and press **Enter**.

Note: After installing the hard disks into the hot-swap capable drive bays, wait several seconds to allow the disks to fully power on, before using the Rescan command.

Window Menu

The Window menu provides several view options.



- **Maximize** – enlarge viewing area of the selected window (Disk or Array)
- **Minimize** – reduce the viewing area of the selected window)
- **Disk** – selects the Disk window
- **Array** – selects the Array window
- **Refresh** – scans for any hardware changes (used when adding arrays or disks to the card)

HighPoint RAID Management and Device Driver CD

Each retail box includes a copy of the HighPoint Products Software CD.

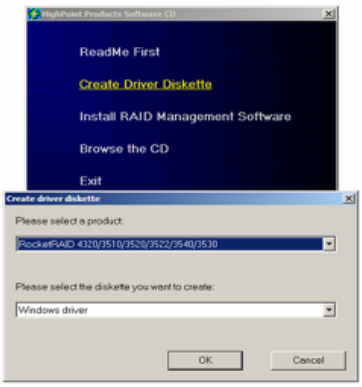
This CD can be used to generate driver diskettes, and install the HighPoint RAID Management Utility Suite for a variety of operating systems.

1 - Creating a driver diskette

Windows 2000, 2003 and several distributions of Linux and FreeBSD require driver diskettes when installing the operating system directly to a disk or array hosted by the Rocket RAID host adapter.

To create a driver floppy diskette:

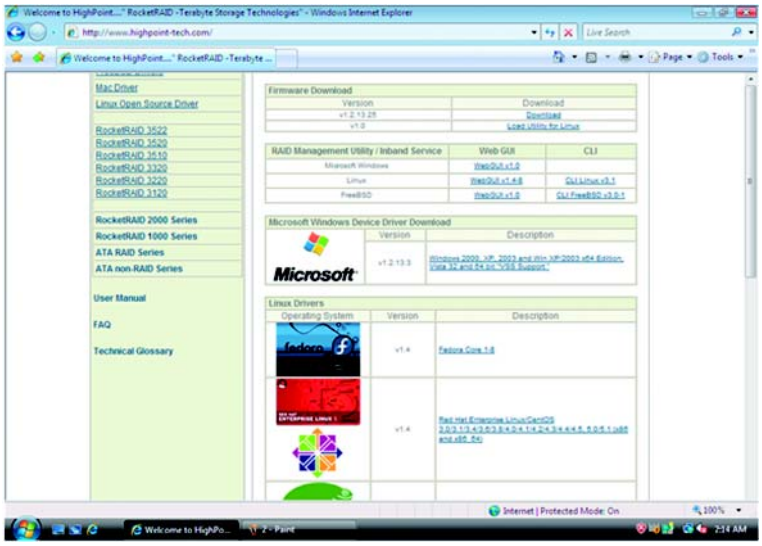
1. Insert the CD into the system's CD/DVD drive. The program should start automatically.
2. Insert a blank floppy diskette into the system's floppy drive.
3. Click on "Create Driver Diskette".
4. Click on the "Please Select a Product" drop-down button, and select the appropriate host adapter model from the list.
5. Click on the "Please Select the Diskette you want to create" drop-down button, and select the desired operating system from the list.
6. Click on the "OK" button to create the driver diskette.



2 - Device Driver Installation

We recommend visiting the RocketRAID download page for the latest Windows Device Driver updates:

you can access below website:
http://www.highpoint-tech.cn/China/biosc.htm
Then, RocketRAID controllers are represented,you can press relevant Link to access Product Driver.



Drivers are posted in .zip archive format. Most Windows operating systems will recognize this archive format, natively. Double click the driver download to view and extract their contents. Drivers can be extracted and/or copied to various media.

Windows Driver Installation (Win2000, XP, Win 2003)

Before installing the RocketRAID 35xx host adapter's device driver, make sure the host adapter and all required hard disks have been installed into the system's chassis/ disk enclosure. If you are working with a supplied driver, or driver download, you will want to extract the contents directly to a directory of your choice (or device). You will need to browse to this location, in order to load the driver (see step 2, below).

Installing the RocketRAID 35xx driver for an existing Windows system.

After the operating system has booted, Windows will automatically detect the RocketRAID 35xx host adapter, and request that a device driver be installed. To install the device driver, follow the steps outlined below:

1. When the "Found **New Hardware Wizard**" window appears, select "**Install from a list or specific location (Advanced)**", and click Next to continue.
2. Click on the "**Include this location in the search**" option, and select the system's floppy drive (generally Disk A). Next, insert the Driver Installation diskette into the system's floppy drive, or select Browse, and browse to the location of the driver. ***If you are using the RocketRAID 35xx software CD, the drivers are located in RR3xxx_4xxx – Windows –Driver– Windows (then select the appropriate folder).***
3. Windows may display a warning message that states the driver has "**not been signed**". Select "**Continue Anyway**", then click Finish when prompted. When windows asks to reboot the system, choose No.
4. emove the Driver Installation diskette from the floppy drive, then Shut down and restart the computer.

Installation Verification

After the driver has been installed, and the system has been restarted:

1. Click the Start button, then right-click the "My Computer" icon. Select the Properties item from the pop up menu.
2. In the popup window, click the "Hardware" tab then click Device Manager button.
3. Double click the "**SCSI and RAID controllers**" entry. If the RocketRAID 35xx device entry is not displayed, or there are "?" or "!" marks displayed near the RocketRAID 35xx entry, the driver has not been installed properly. Delete the entries and reinstall the driver.

Installing the RocketRAID driver during a fresh Windows installation

1. After booting from the Windows CD or DVD-ROM, when the Windows Setup blue screen appears, look towards the bottom of the screen. Windows will prompt you to press the **F6** key if you want to install a third party SCSI or RAID driver. Press the **F6** key at this time.
2. The setup procedure will continue, and will later instruct you to press the "**S**" key to specify additional adapters. Press the "**S**" key as instructed.
3. Next, the setup program will prompt for the insertion of the driver diskette. Please insert the driver diskette, and then press ENTER to continue.
4. The next window will display several driver options. Please select the driver for the corresponding operating system, and press ENTER to continue.

Windows Vista/2008 Driver Installation

Installing the driver during a fresh Windows Vista/2008 installation

1. Boot from Windows Vista DVD.
2. When the screen "**where do you want to install Windows**" appears, click "**Load driver**" and browse for the driver location. Windows Vista will accept install drivers from various sources: floppy diskette, USB flash disk or CD. ***If you are using the RocketRAID 35xx software CD, the drivers are located in RR3xxx_4xxx – Windows-Driver – VistaWin2008 – 32 (or 64, if you are running a 64-bit version of the operating system).***
3. Select the RocketRAID 35xx controller driver, and click "**Next**".
4. The driver is now installed – you can now commence with the standard OS installation procedures.

Installing the driver for an existing Windows Vista/2008 system

1. Intall the RocketRAID 35xx host adapter into the PC, then boot up Windows.
2. Windows should automatically detect the card, and display the "Found **New Hardware**" wizard pop-up window. Select "**Locate and install driver software**". When Windows asks: "**Windows needs your permission to continue**", select "continue".
3. Select "I don't have disc, show me other options" and then select "Browse my computer for driver software".
4. Specify the location of the driver and click "Next. ***If you are using the RocketRAID 35xx software CD, the drivers are located in RR3xxx_4xxx – Windows-Driver – VistaWin2008 – 32 (or 64, if you are running a 64-bit version of the operating system).***
5. When asked: "Would you like to install this driver software?" select "Install".
6. Reboot the system when prompted. The RocketRAID 35xx will be available for use after Windows reboots.

Installation Verification

After the driver has been installed, and the system has been restarted:

1. Click the Start button, then right-click My Computer icon. Select the Properties item from the popup menu.
2. In the popup window, select Hardware tab and then click Device Manager button.
3. Double click the "**Storage Controllers**" entry. If the RocketRAID 35xx device entry is not displayed, or there are "?" or "!" marks displayed near the RocketRAID 35xx entry, the driver has not been installed properly. Delete the entries and reinstall the driver.

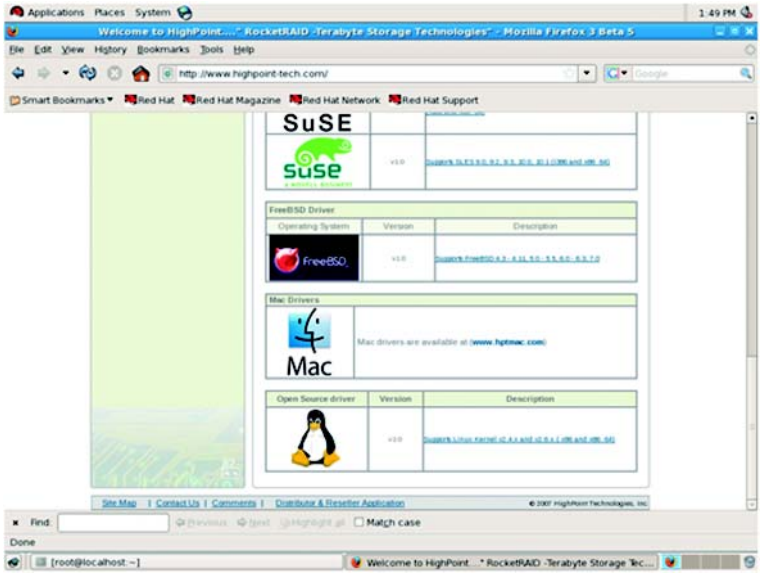
Linux and FreeBSD Device Driver installation

The RocketRAID 35xx host adapter is fully GPL compliant, and is natively support by Linux kernel 2.6.25x. Linux distributions that utilize this kernel (and all later releases) will automatically recognize the host adapter, and do not require driver installation.

In addition, binary and source driver updates are routinely posted for a variety of older Linux operating systems including past versions of Red Hat Enterprise, CentOS, OpenSuSE, and Fedora Core.

Drivers are also available for several FreeBSD revisions, and are available from the same support page:

you can access below website:
http://www.highpoint-tech.com/USA/bios.htm
Then,RocketRAID controllers are represented,you can press relevant Link to access Product Driver.



Several driver sets are included with the RocketRAID 35xx Software CD.
Each binary driver and source package includes an installation guide (.pdf format).

Linux Driver sets:
RR3xxx_4xxx/Linux directory.
FreeBSD Driver sets:
RR3xxx_4xxx/FreeBSD directory.

3 - HighPoint RAID Management Utilities (HRM)

The HighPoint RAID Management Utility Suite, also known as "HRM", includes several user interface options. The latest version of the Web Management utility user manual, is available from our website.

Windows Operating Systems – Installing the Web-based Management Utility

Click on "**Install RAID Management Software**".

Select the desired software from the drop down menu, and click on the "OK" button.

ReadMe First
Create Driver Diskette
Install RAID Management Software
Install Management Software
Please select the software to install.
HighPoint Web RAID Management Software (for RocketRAID 2xxx)
HighPoint Web RAID Management Software (for RocketRAID 3120/3510/3520)
HighPoint In-Band Management Service (for RocketRAID 3xxx/4xxx with OBM)
OK
Cancel

Red Hat Enterprise/CentOS, Fedora Core, Open SuSE – Installing the Web-based Management utility

Linux operating systems that support .rpm packages, allow you to double-click the HighPoint Web RAID Management .rpm file to start the installation process.

1. Copy the Web RAID Management package from the RocketRAID 35xx Software CD, to the desktop of the Linux operating system. The .rpm file is located in HighPoint RAID Management Software – RR3xxx_4xxx - Linux – WebGui-Linux. tbz.
2. Extract the .tbz file to the desktop, and browse to the appropriate .rpm file (there are 32 and 64-bit options).
3. Double click the .rpm file – this should open the operating systems' software installer. Enter the Administrative password when prompted and proceed with installation.
4. The package can also be installed manually, using a terminal. Lon in as "root", open a terminal, and browse to the location of the .rpm file. Run the following command:
5. # rpm -i hptsvr-https-1.4-8.i386.rpm (or hptsvr-https-1.4-8.x86_64.rpm)

Note: *The i386 rpm package can also work on 64-bit systems if you have 32-bit runtime libraries installed. If you use the x86_64 rpm package, please make sure the controller driver has 64-bit ioctl support.*

Debian/Ubuntu Linux Distributions – Installing the Web-based Management Utility

For Debian/Ubuntu Linux distributions, you can use **alien** to convert the rpm packages to a .deb package, then use "**dpkg -i**" command to install each package. Some script files may be lost during the conversion process from rpm to .deb, so you may need to make manual corrections.

The following files will be installed/configured:

/usr/bin/hptsvr - service program
/etc/hptcfg - service config file
/etc/rc.d/init.d/hptdaemon - service control script
/usr/share/hpt/webguiroot - data files

If there is no /etc/hptcfg present, you can add it manually using by using the "echo" command on the driver file name to /etc/hptcfg.

For example:
echo hptiop.ko >/etc/hptcfg

Uninstalling the Utility

Open a terminal, and use the following command:
rpm -e hptsvr-https

Linux Distributions – Command Line Interface (CLI)

Command Line interface versions of the RocketRAID management utilities are available for Linux and FreeBSD operating systems.

These packages are posted on the HighPoint Technologies, Inc. website, under the BIOS & Driver downloads page for the RocketRAID 35xx.

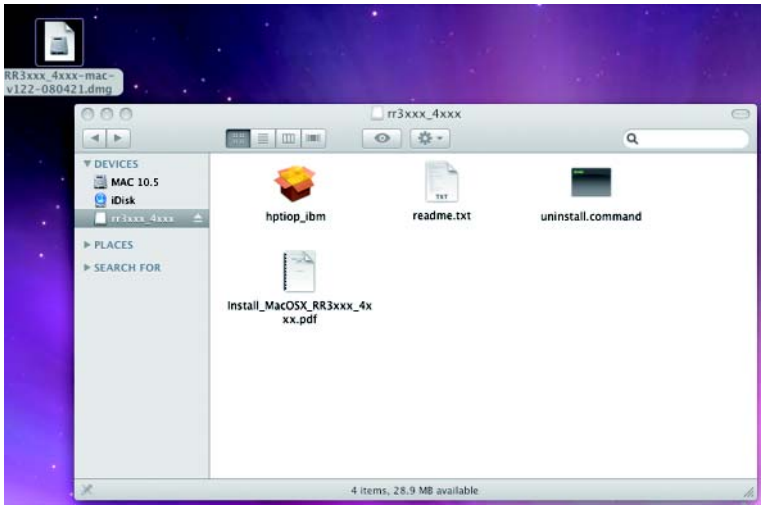
Mac OS X Driver and Web-based RAID Management Utility

The driver and software packages for the RocketRAID 35xx includes both the device driver for OS X, and a copy of the Web RAID Management utility.

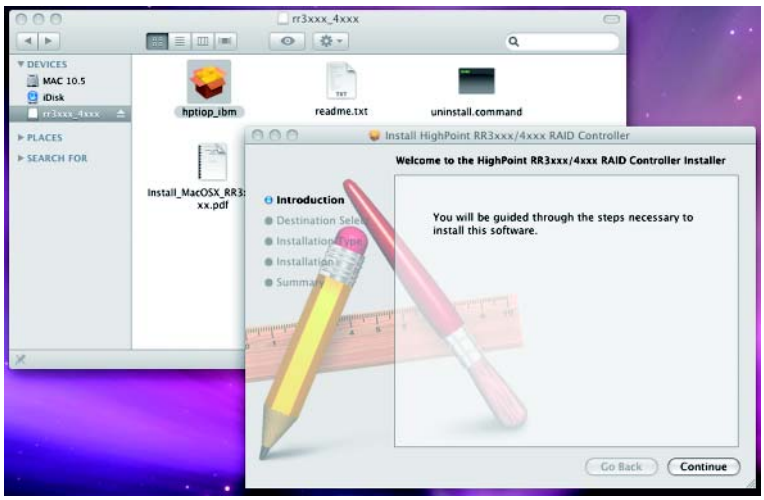
Please check http://www.hptmac.com for the latest software/driver packages.
Driver updates are posted on the card's product page, under the "Download Center" section.
The latest package is posted towards the right-hand side of the page, under "Mac Driver". On the left-hand side of the page, there is a section devoted to user documentation. The latest versions of the Product, and Web-based RAID Management Manuals are posted here.

Mac OS X Driver and RAID Management Installation

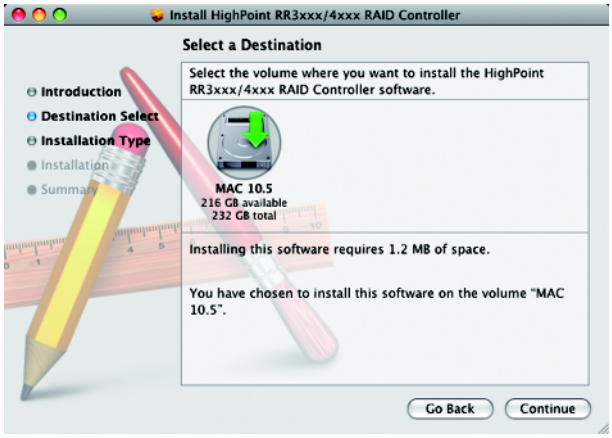
The driver and software packages for the RocketRAID35xx includes both the device driver for OS X, and a copy of the Web RAID Management utility. Copy the Mac driver and software package from the Software CD, to the Mac Desktop. Open the . dmg file, and double click "rr3xxx_4xxx" to begin installation.



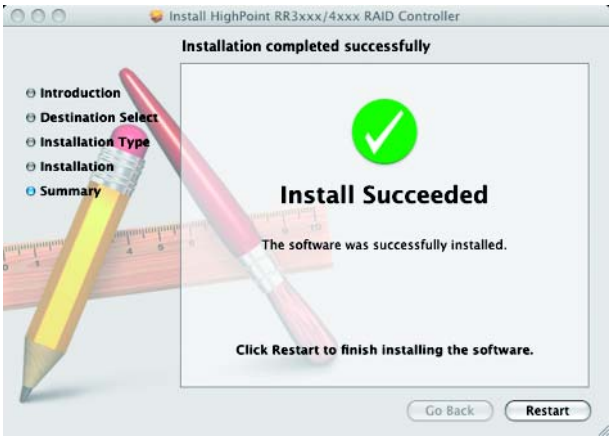
Click "**Continue**" to proceed with installation



Select the installation destination:


Install HighPoint RR3xxx/4xxx RAID Controller
Select a Destination
Introduction
Destination Select
Installation Type
Installation
Summary
Select the volume where you want to install the HighPoint RR3xxx/4xxx RAID Controller software.
MAC 10.5
216 GB available
232 GB total
Installing this software requires 1.2 MB of space.
You have chosen to install this software on the volume "MAC 10.5".
Go Back
Continue

Click "**Continue**"



Click "**Restart**" – after OS X reboots, the card will be recognized by the system. Configure arrays using the Web RAID Management interface. User guides for the Web interface are available from http://www.hptmac.com. Check the product page for the RocketRAID 35xx, and click on the "Download Center" link.

If the users have more requirements to boot from the Host Adapter,please performing below step.

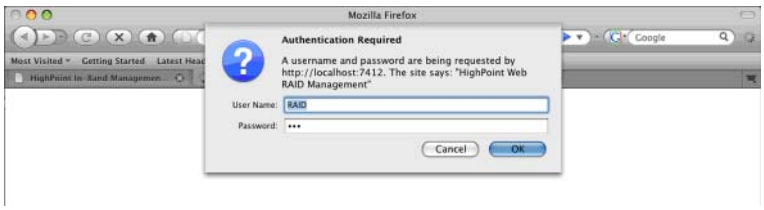
Configure the cards to support booting OS X, fo Mac Pro systems
Updating the Rocket RAID Firmware – EFI

For RocketRAID 35xx and 4xxx host adapters

1) Log into RAID Management Utility (Web GUI). Open a web browser (such as Safari or Firefox) and enter the following URL: http://localhost:7402

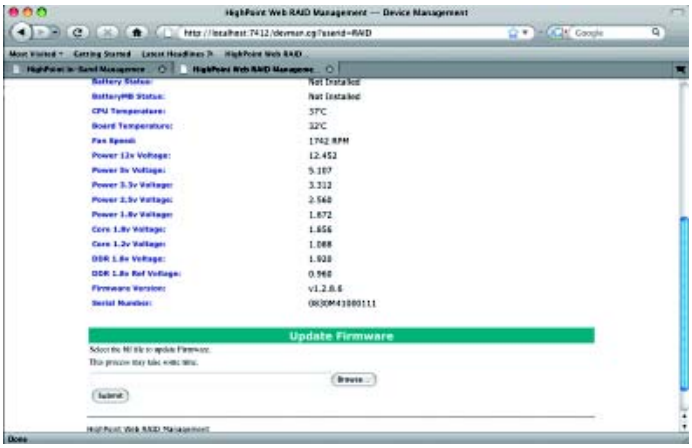
2) Once connected click on the Access URL – this will open the log in screen.

3) Type in the User name and Password, then click "OK". The default Username is **RAID**, while the default Password is **hpt**.



4) After successfully logging in, the Web GUI will display the **Manage – Array** screen. Select **Manage – Device** from the menu, and scroll to the bottom of this page and locate the **Update Firmware** function.

5) Click on the **Browse** button, and browse to the location of the EFI firmware update. The EFI firmware is the second file included with Driver and Firmware download (see step 3).



6) Select the firmware update (.**blf** file) and click the **Submit** button. The interface will notify you when the update is complete. Exit the Web GUI and reboot OS X.

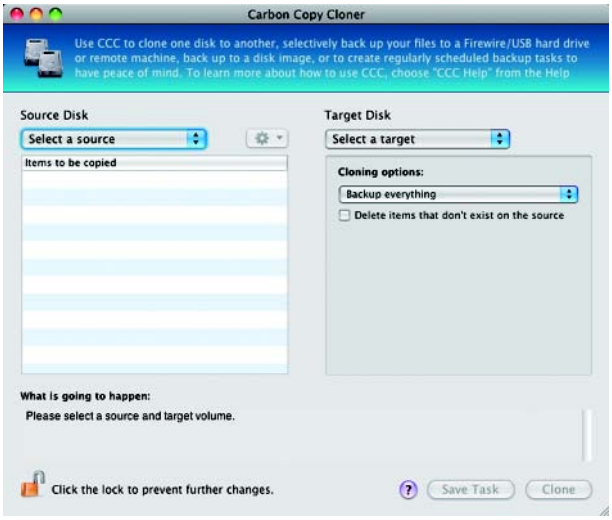
Cloning the boot volume to a RAID Array

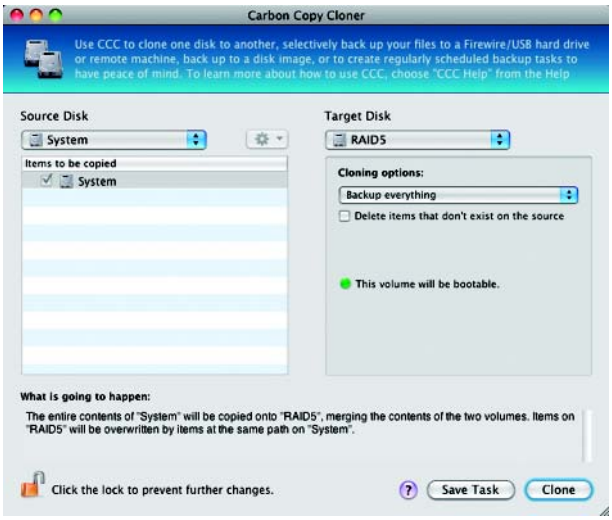
1) After flashing the EFI firmware update, download **Carbon Copy Cloner**. Carbon Copy Cloner is a free disk imaging utility that can be used to duplicate the system's current boot volume, to a disk or RAID array attached to the RocketRAID card. http://www.bombich.com/software/ccc.html

2) Clone OS disk to disk on RAID array

Bombich Software: Carbon Copy Cloner
http://www.bombich.com/software/ccc.html
Bombich Software: Carbon Copy Cloner
Carbon Copy Cloner
© Mike Bombich, 2002-2008
Download CCC 3 now! (Tiger and Leopard)
Clone, synchronize, backup. Schedule and forget it. Try it 'til you trust it.
The key to a successful backup plan is to actually do the backups regularly. When left to a human, the task often gets tacked on to the end of a very long list of other things to do. When you eventually have a catastrophe, the data is simply gone. You know that feeling -- you just lost six years of family photos. Your kids being born, their first birthdays, their first everything. The answer to this is consistent and regular backups, placed on a schedule and handled automatically by your computer.
CCC 3 features an interface designed to make the cloning and backup procedure very intuitive. In addition to general backup, CCC can also clone one hard drive to another, copying every single block or file to create an exact replica of your source hard drive. CCC's block-level copy offers the absolute best fidelity in the industry!

3) Start Carbon Copy Cloner. For the Source disk, select the current Mac OS X boot drive. For the Target disk, select a disk or array attached to the RocketRAID host adapter.


Carbon Copy Cloner
Use CCC to clone one disk to another, selectively back up your files to a Firewire/USB hard drive or remote machine, back up to a disk image, or to create regularly scheduled backup tasks to have peace of mind. To learn more about how to use CCC, choose "CCC Help" from the Help
Source Disk
Select a source
Items to be copied
Target Disk
Select a target
Cloning options:
Backup everything
Delete items that don't exist on the source
What is going to happen:
Please select a source and target volume.
Click the lock to prevent further changes.
Save Task
Clone


Carbon Copy Cloner
Use CCC to clone one disk to another, selectively back up your files to a Firewire/USB hard drive or remote machine, back up to a disk image, or to create regularly scheduled backup tasks to have peace of mind. To learn more about how to use CCC, choose "CCC Help" from the Help
Source Disk
System
Items to be copied
System
Target Disk
RAID5
Cloning options:
Backup everything
Delete items that don't exist on the source
This volume will be bootable.
What is going to happen:
The entire contents of "System" will be copied onto "RAID5", merging the contents of the two volumes. Items on "RAID5" will be overwritten by items at the same path on "System".
Click the lock to prevent further changes.
Save Task
Clone

4) Once the Source and Target disks have been selected, click **Clone** to start the duplication process. The utility will display a progress bar and notify you when the copy procedure is complete.

Disk-to-disk clone [File-level]
Cloning...
/Applications/DVD Player.app/Contents/Resources/fi.lproj/Localizable.strings
Untitled
RAID1
Data copied: 156.52 MB
Time elapsed: 00:00:21
Stop
Get a SuperDrive from OWC that burns faster.
www.macsales.com
What is going to happen:
"RAID1" will be completely erased, then the entire contents of "Untitled" will be copied onto "RAID1". A block-level clone will be attempted. If a block-level clone cannot occur, a file-level copy will proceed instead.
Click the lock to prevent further changes.
Save Task
Clone

Change the boot volume

1) After cloning the boot volume, open the **System Preferences** window and select "**Startup Disk**".

2) Set the RAID array or disk attached to the RocketRAID card as the startup disk, and click "**Restart**".

Startup Disk
Show All
Select the system you want to use to start up your computer
Mac OS X, 10.5
on System
Network Startup
You have selected Mac OS X, 10.5
on the volume "System."
Restart...
Click to restart this computer in Target Disk Mode
After you restart this computer in Target Disk Mode, you can connect it
to another computer using a FireWire cable and use it as a hard disk.
Target Disk Mode...
Click the lock to prevent further changes.

3) You can also select the boot volume using the **Alt** key, after powering up the Mac system. This command will display available boot volumes.

Customer Support

If you encounter any problems while utilizing the RocketRAID host adapter, or have any questions about this or any other HighPoint product, feel free to contact our Customer Support Department.

Troubleshooting Checklist

Before contacting our Customer Support department:

- Make sure the latest BIOS, driver and HighPoint RAID Management software has beein installed for the host adapter. The latest updates are available from our website.
- Prepare a list of the computer system's hardware and software (motherboard, CPU, memory, other PCI-E devices/host adapters, operating system, applications)

Contact Information

E-mail address: support@highpoint-tech.com

Phone: 408-240-6119

9:00AM-5:00PM, Pacific Standard Time

Contact Us

HighPoint Corporate Headquarter USA

Address 1161 Cadillac Ct.
Milpitas, CA, 95035
Website: http://www.highpoint-tech.com
Phone: 1-408-942-5800 (9 am ~ 6 pm PST, M-F) **Fax:** 1-408-942-5801
E-mail: sales@highpoint-tech.com
Support: support@highpoint-tech.com
Support Phone: 1-408-240-6108 (9 am ~ 5 pm PST, M-F)

HighPoint Taiwan

5F., No.3, Swei Lane , Jhongjheng Rd.
Sindian City, Taipei County 231, Taiwan (R.O.C.)
Website: http://www.highpoint-tech.com/Taiwan/indextw.htm
Phone: + 886-2-2218-3435 (9 am ~ 6 pm)
Fax: +886-2-2218-3436
E-mail:sales@highpoint-tech.com
Support: support@highpoint-tech.com

HighPoint China

4th Floor Kehaifulin Building, N0. 12
Zhong Guan Cun South Rd.
Haidian District Beijing, China 100081
Website: http://www.highpoint-tech.cn/
Phone: + 86-10-6213-0920 (9 am ~ 6 pm)
Fax: +86-10-6897-5074
E-mail: sales@microaurora.com.cn
Support: support@microaurora.com.cn

FCC Part 15 Class B Radio Frequency Interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

European Union Compliance Statement

This Information Technologies Equipment has been tested and found to comply with the following European directives:

- European Standard EN55022 (1998) Class B
- European Standard EN55024 (1998)

Thank You

Thank you for purchasing the RocketRAID 35xx SAS/SATAII RAID Host adapter. We appreciate your support, and welcome any questions, comments or product suggestions you may have.